KMT - Kraus Messtechnik GmbH

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Home Page: http://www.kmt-telemetry.com, Email: info@kmt-telemetry.com

CT2-Mini

User manual

INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

General functions:

CT2-Mini Telemetry system with accessories

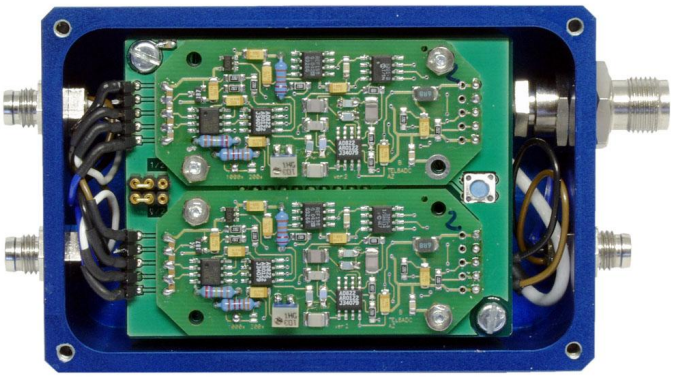
CT2-Mini is a 2-channel telemetry system designed for easy mounting onto rotating and moving parts to provide non-contact transmission of measured parameters such as pressure, force, temperature, acceleration and voltage. Also for point to point application like bridge or buildings testing, you can install CT2 Mini instead long cables from the sensor to the Computer.

Sensors inputs are connected via screw on, waterproof connectors. Measured values are prepared in analog format, digitized and transmitted via radio frequencies. Different carrier frequencies are provided, this allows up to four systems to operate in parallel. The complete transmitter assembly is waterproofed to IP65 specifications.

The following sensors can be connected to the system: (STG) Strain gages sensors in full-, and half- bridge configuration (350 ohm or greater), Type K Thermocouples to 1000°C, ICP, potentiometers sensors and capacitive sensors. Voltage inputs of +/-5V and +/-10V are available.

The measured values are processed and output as +/-5V analog signals at the BNC sockets (optional digital output for special PCM interface into a PC) on the stationary receiver.

Resolution of 12 bits is standard; this enables an amplitude dynamic of 72 dB. The analog signal bandwidth is up to 12000Hz (see table). The measurement accuracy is +/-0.25 % (without sensor). The CT2-Mini is suited for operation at ambient temperatures of -20 to +70°C. The transmission distance between transmitter and receiving antenna is of the order of 250* m (*40kbit with10mW transmitting power – non diversity) With diversity only 100m range



Cut off frequency from anit-aliasing filter scanning rate (see red)	
Bit rate	**per channel**
40 kbit/s	375 Hz (-3dB) (1428 Hz)
320 kbit/s	3000 Hz (-3dB) (11428 Hz)
640 kbit/s	6000 Hz (-3dB) (22857 Hz)
1280 kbit/s	12000 Hz (-3dB) (45714 Hz)

CT2 Mini Transmitting Unit Technical Data (Encoder)

CT-STG-V2:

Sensor:	strain gage, > 350 Ohms
Bridge completion:	full and half bridge
Excitation:	4 VDC (fixed), short-circuit protection
Gain:	**250-500-1000-2000** selectable by solder jumpers **(CT-STG-V1 only with Gain 200-1000)**
Offset	Zero adjustment by potentiometer or **optional** **Auto-zero** function (which is not lost by power-off), offset range up to 80% of full scale.

CT-ICP-V2:

Constant current:	4mA (fixed)
Gain:	2x, 4x, 8x, 16x or 32x
Signal bandwidth:	3 Hz to 12000Hz (depended of transmitter!)

CT-POT:

Sensor:	Potentiometer Sensor >350 Ohms to 10kOhms
Excitation:	4 VDC (fixed)

CT-TH-K-ISO:

Sensor:	thermo-couple, type K (with cold junction compensation)
Temperature measuring range:	-50°C to +1000°C (other on request) **with galvanic isolation, Accuracy 1%**
Signal bandwidth:	0...10 Hz -3dB

CT-PT100:

Sensor:	resistance temperature detectors (RTDs) with resistance of 100 ohm
Temperature measuring range:	-100°C to +500°C

CT-VOLT:

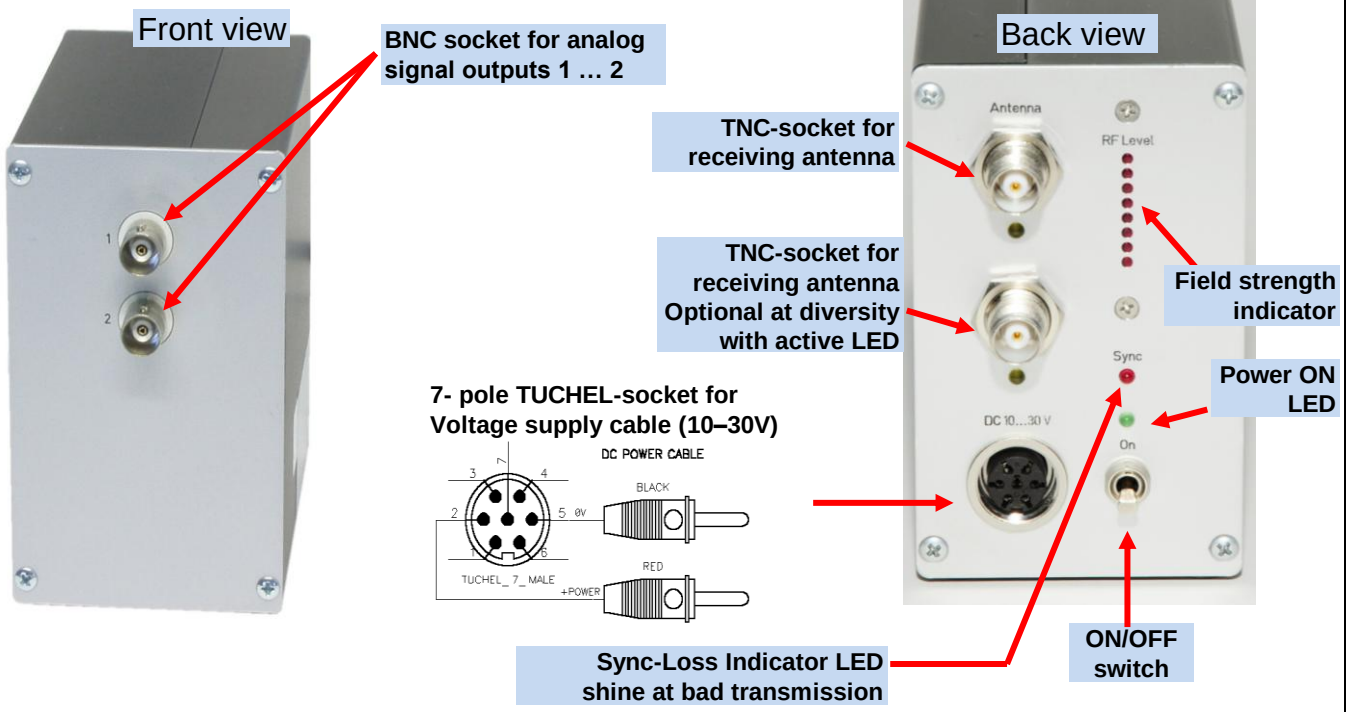
High-level inputs:	+/- 5 Volt or +/- 10 Volt

System Parameters:

Channels:	2
Resolution:	12 bit A/D converter with anti aliasing filter, simultaneous sampling of all channels
Line-of-sight distance with diversity telemetry:	200m with 40kbit, 150m with 320/kbit, 100m with 640kbit, 50m with 1280kibt (free view)
Line-of-sight distance with **non-diversity** telemetry:	500m with 40kbit (free view)
Powering:	6-30 V DC
Power consumption:	100 mA at 12V using 2 STG sensors at 350 Ohms
Analog signal bandwidth:	
Transmission:	Digital PCM Miller Format
Transmission Power:	10mW
Dimensions:	102 x 68 x 41 mm (without connectors)
Weight:	0.45 kg without cables
Operating temperature:	- 20 … +70°C
Housing:	Aluminum anodized, waterproofed (IP65)
Humidity:	20 ... 80% no condensing
Vibration:	5g Mil Standard 810C, Curve C
Static acceleration:	100g in all directions
Shock:	200g in all directions

Bit rate	2 Channels
1280 kbit/s	12000 Hz (45714 Hz)
640 kbit/s	6000 Hz (22857Hz)
320 kbit/s	3000 Hz (11428 Hz)
40 kbit/s	375 Hz (1428 Hz)

Technical data:
Receiving Unit CT2-Mini DEC (Decoder)



System Parameters:

Channel:	2 analog outputs via (BNC) +/-5V
Resolution:	12 bit D/A converter, with smoothing filter
Dynamic:	72dB
Receiver	40kbit standard with not diversity receiver
	40kbit, 320kbit, 640kbit and 1280kbit with diversity receiver incl. two receiving antennas!
Power supply input:	10-30 VDC
Current consumption:	300mA at 10V, 100mA at 30V
Frequencies:	up to 4 different carrier frequencies available
Dimensions:	105 x 105 x 65mm
Weight:	0.60 kg without cables and antenna
Overall system accuracy between encoder input and decoder output:	+/-0.25% without sensor influences
Environmental	
Operating:	-20 … +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g Mil Standard 810C, Curve C
Static acceleration:	10g in all directions
Shock:	100g in all directions

Connection, STG bridge configuration: CT2-Mini ENC (encoder)

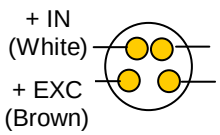
Sensor cable

Black = IN -
White = IN +
Brown = +EXC
Blue = --EXC

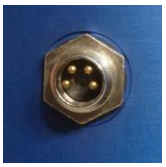
Sensor socket

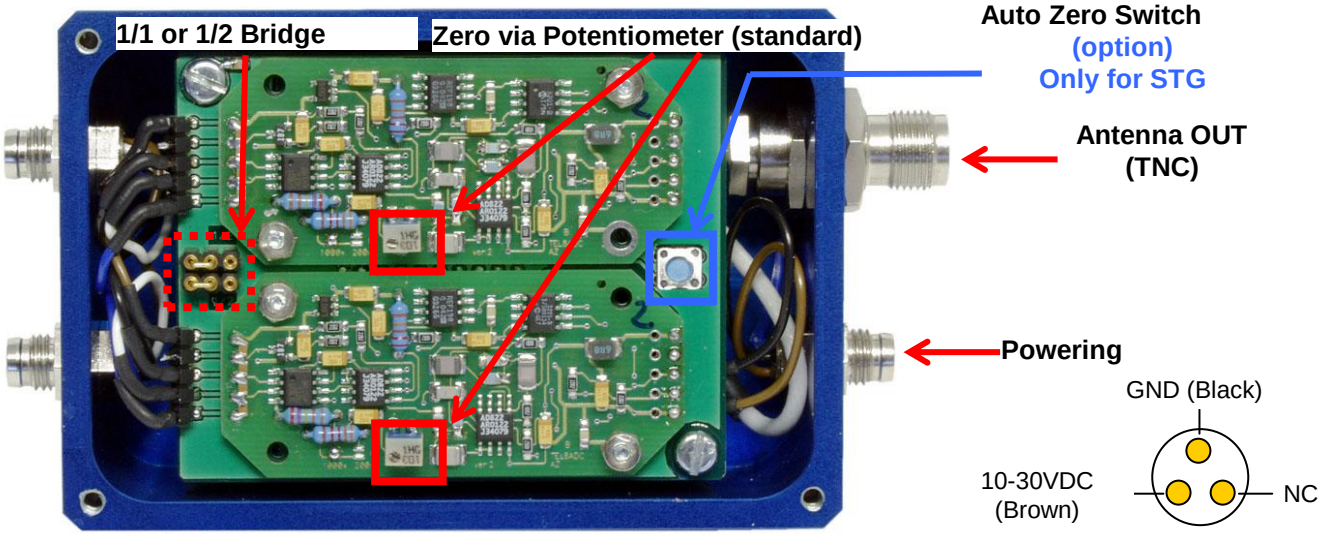
STG module

Type: Strain gage >350 Ohms
Excitation: 4 VDC (fixed)
Gain: 200 or 1000
Accuracy +/- 0.25%

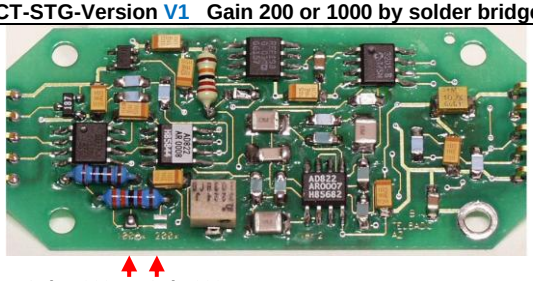


Sensor plug CT2-Mini ENC

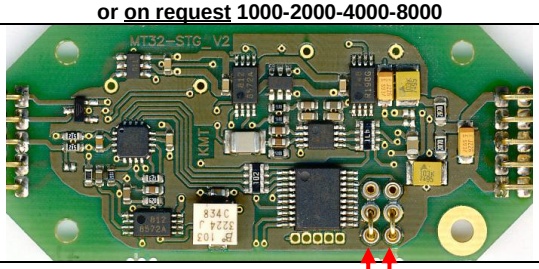


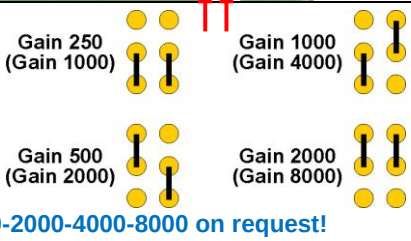


CT-STG-Version V1 Gain 200 or 1000 by solder bridge

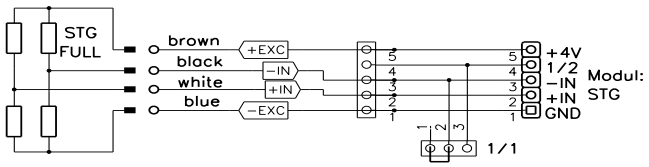


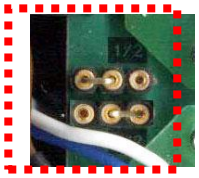
CT-STG-Version V2 Gain 250-500-1000 or 2000 by jumper or on request 1000-2000-4000-8000

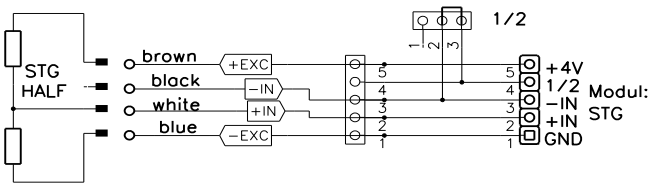




Gain 1000-2000-4000-8000 on request!







Connection CT-POT:

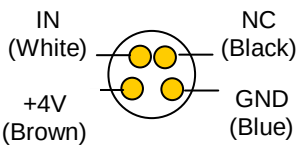
Sensor cable

Black = NC*
Blue = GND
Brown = +4V
White = IN

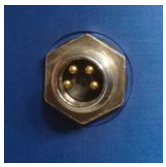
*NC= not connected

Sensor socket

CT-POT module for potentiometer sensors



Sensor plug
CT2-Mini ENC

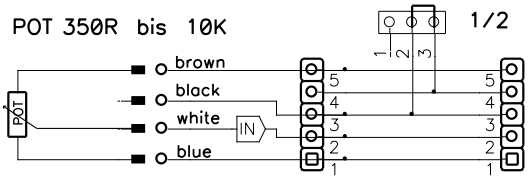


CT-POT (=special type off STG)

Type: Potentiometer >350Ohm to 10kOhm
Excitation: 4 VDC (fixed)
Accuracy +/- 0.25%

Attention:
The POT modules must be configured as a **Half Bridge Unit.**
Don't change offset and gain!!

Half bridge setting



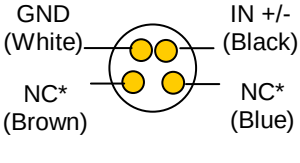
Connection CT-Volt module

Sensor cable

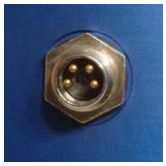
Black = IN +/-
White = GND
Brown = NC*
Blue = NC*

*NC= not connected

Sensor socket



Sensor plug
CT2-Mini ENC

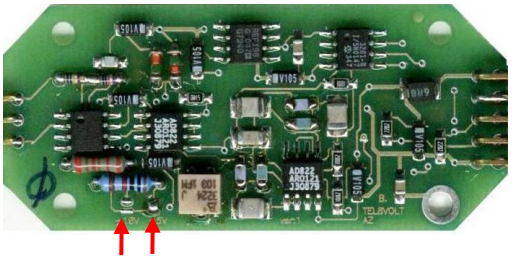


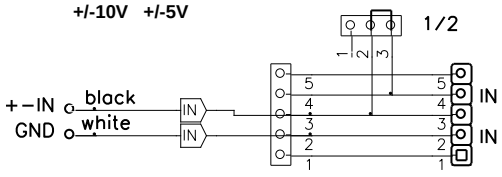
CT-Volt

Type: Volt
Range: +/-5 or +/-10V
Accuracy +/- 0.25%

Attentions:
At **Volt modules** must plug the plug bridge on **Half Bridge Unit.**
Don't change offset!!

Half bridge setting





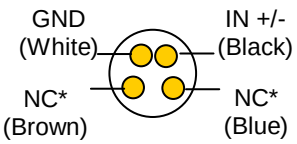
Connection CT-ICP module

Sensor cable

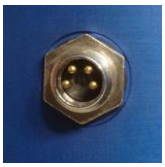
Black = IN +/-
White = GND
Brown = NC*
Blue = NC*

*NC= not connected

Sensor socket



Sensor plug
CT2-Mini ENC

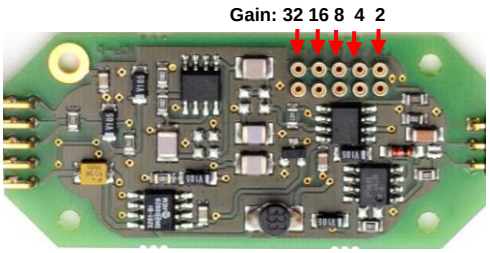


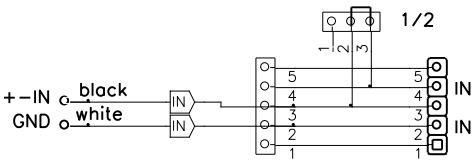
CT-ICP

Type: ICP
Signal bandwidth: 3Hz to (see table)
Gain: 2x, 4x, 8x, 16x or 32x
Constant current: 4mA (fixed)
Accuracy +/- 0.25%

Attentions:
At **ICP modules** must plug the plugbridge on **Half Bridge Unit.**

Half bridge setting

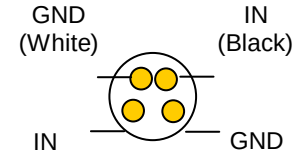


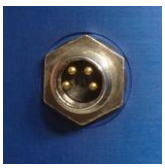


Connection CT-Pt100 module (RTDs)

Black = IN
Connected with
brown

White = GND
Connected with
Blue



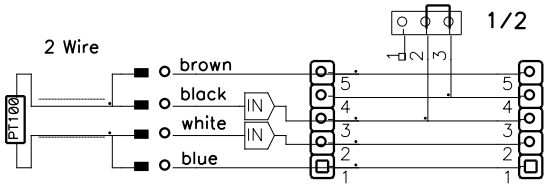


CT-Pt100

Type: RTD 100 ohm
Range: -100 to 500°C
Accuracy +/- 0.25%

Attentions:
At **Pt100 modules** must plug the plug bridge on **Half Bridge Unit.**

Half bridge setting



Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-100	-0,997	150	1,500	400	4,004
-50	-0,497	200	2,001	450	4,498
0	0,001	250	2,501	500	4,999
50	0,499	300	3,001		
100	1,000	350	3,501		

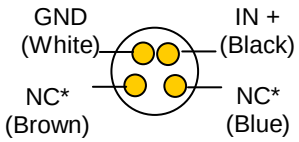
Connection TH-K ISO Thermo couple

Sensor cable

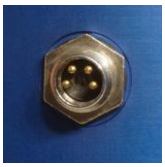
Black = IN +/-
White = GND
Brown = NC*
Blue = NC*

*NC= not connected

Sensor socket



Sensor plug
CT2-Mini ENC

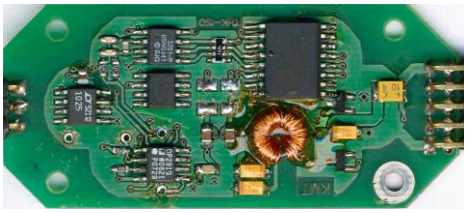


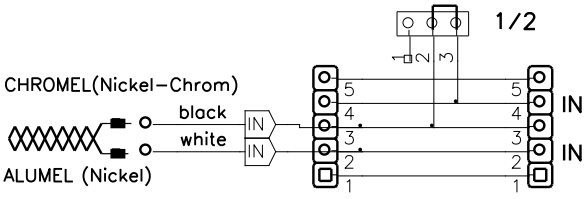
CT-THK-ISO - Galvanic isolated!

Type: K
Range: -50°C – 1000°C
Bandwidth: 0-20Hz (more on request)
Accuracy +/-1%

Attentions:
At **Thermo couple** must plug the plug bridge on **Half Bridge Unit.**

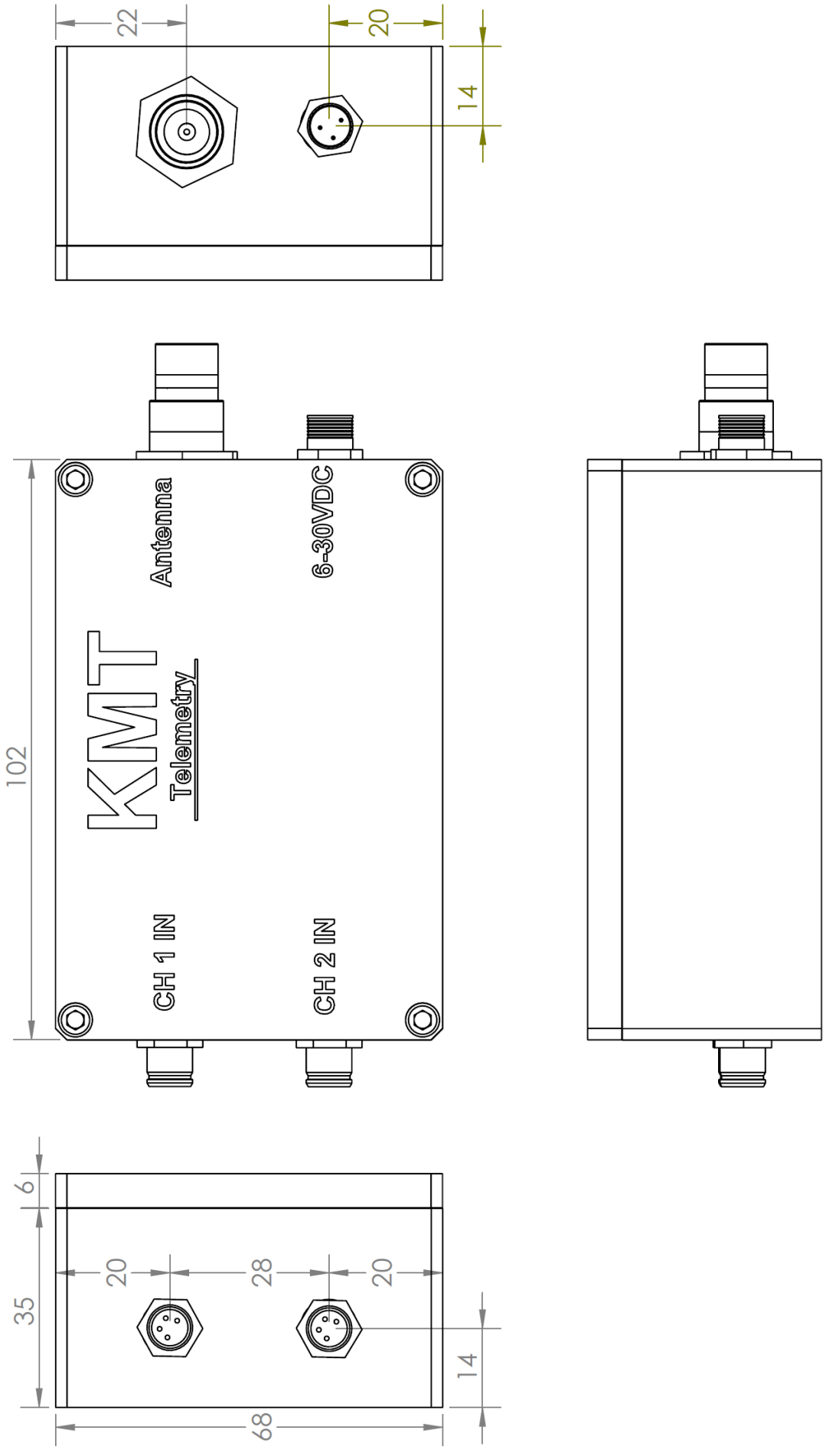
Half bridge setting





Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-0.220	250	1.236	550	2.754	850	4.262
0	0.013	300	1.482	600	3.010	900	4.506
50	0.254	350	1.734	650	3.266	950	4.746
100	0.504	400	1.990	700	3.519	1000	4.980
150	0.752	450	2.242	750	3.700		
200	0.992	500	2.498	800	4.015		

Dimensions of CT2-MINI-ENC



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Konformitätserklärung

Declaration of Conformity
Declaration de Conformité

Wir We Nous	**KMT - Kraus Messtechnik GmbH**
Anschrift Address Adress	**Gewerbering 9, D-83624 Otterfing, Germany**

erklären in alleiniger Verantwortung, daß das Produkt
declare under our sole responsibility, that the product
declarons sous notre seule responsibilité, que le produit

Bezeichnung Name Nom	**Messdatenübertragungssystem**
Typ,Modell,Artikel-Nr., Größe Type,Model, Article No.,Taille Type, Modèle, Mo.d'Article,Taille	**CT2, CT4, CT8, CT16**

mit den Anforderungen der Normen und Richtlinien
fulfills the requirements of the standard and regulations of the Directive
satisfait aux exigences des normes et directives

108/2004/EG	**Elektromagnetische Verträglichkeit EMV / EMC** DIN EN 61000-6-3 Ausgabe 2002-8 Elektromagnetische Verträglichkeit EMV Teil 6-3 Fachgrundnorm Störaussendung DIN EN 61000-6-1 Ausgabe 2002-8 Elektromagnetische Verträglichkeit EMV Teil 6-1 Fachgrundnorm Störfestigkeit

und den angezogenen Prüfberichten übereinstimmt und damit den Bestimmungen entspricht.
and the taken test reports und therefore corresponds to the regulations of the Directive
et les rapports d'essais notifiés et, ainsi, correspond aux règlement de la Directive.

Otterfing, 30.05.2006 **Martin Kraus**

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www.kmt-gmbh.com

Ort und Datum der Ausstellung Place and Date of Issue Lieu et date d'établissement	Name und Unterschrift des Befugten Name and Signature of authorized person Nom et signature de la personne autorisée